

## WEST Search History

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DATE: Sunday, August 06, 2006

Hide?	Set Name	Query	Hit Count
		<i>DB=PGPB,USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L14	(mercaptoundecanoic or mecaptoundeconic) same gold same cluster	2
<input type="checkbox"/>	L13	mercapto\$ same gold same cluster	40
<input type="checkbox"/>	L12	mercapto\$ and L11	1
<input type="checkbox"/>	L11	5,629,213.pn.	1
		<i>DB=USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L10	L9	55
		<i>DB=PGPB,USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L9	gold and l6	150
<input type="checkbox"/>	L8	scaffold and gold and l6	27
		<i>DB=USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L7	mercaptoundecanoic or mecaptoundeconic	99
		<i>DB=PGPB,USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L6	mercaptoundecanoic or mecaptoundeconic	230
<input type="checkbox"/>	L5	(mercap\$ or undec\$ or \$undec\$) and L3	1
<input type="checkbox"/>	L4	(polylysine or lysine) and 5,521,289.pn.	1
<input type="checkbox"/>	L3	5,521,289.pn.	1
<input type="checkbox"/>	L2	mercap\$ and 10/013,334	4
<input type="checkbox"/>	L1	(mercap\$ and (10/816603 ))	1

END OF SEARCH HISTORY

## WEST Search History





DATE: Sunday, August 06, 2006

Hide?	<u>Set</u> <u>Name</u>	<u>Query</u>	<u>Hit</u> <u>Count</u>
		<i>DB=USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L22	device same substrate and L18	1
<input type="checkbox"/>	L21	device and L18	1
<input type="checkbox"/>	L20	substrate and polylysine and L18	1
<input type="checkbox"/>	L19	polylysine and L18	1
<input type="checkbox"/>	L18	mercaptoundecanoic and 6,872,971.pn.	1
<input type="checkbox"/>	L17	6,872,971.pn.	1
<input type="checkbox"/>	L16	ultraflat with glass	2
<input type="checkbox"/>	L15	ultraflat	72
<input type="checkbox"/>	L14	polylysine same ultraflat same ((alkanethiol or \$alkanethiol) or silane)	0
<input type="checkbox"/>	L13	polylysine same gold same ((alkanethiol or \$alkanethiol) or silane)	2
<input type="checkbox"/>	L12	polylysine same silicon same ((alkanethiol or \$alkanethiol) or silane)	12
<input type="checkbox"/>	L11	polylysine same silicon	46
<input type="checkbox"/>	L10	polylysine same (silicon with nitride)	2
<input type="checkbox"/>	L9	polylysine same (silicon or nitride or ultraflat or gold)	143
<input type="checkbox"/>	L8	polylysine same (attach\$ or coupl\$ or bind or bond\$) same substrate SAME (silicon or nitride or ultraflat or gold)	15
<input type="checkbox"/>	L7	POLYLYSINE	6136
<input type="checkbox"/>	L6	(polylysine same (attach\$ or coupl\$ or bind or bond\$)) same substrate same (silicon or (silicon with nitride) or (ultraflat with glass) or gold)	14
		<i>DB=PGPB,USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L5	10/816603 and polylysine	1
<input type="checkbox"/>	L4	(polylysine with (coupl\$ or bind or bond\$)) same (silicon or (silicon with nitride) or (ultraflat with glass) or gold)	13
		<i>DB=USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L3	L2	2
		<i>DB=PGPB,USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L2	(polylysine with (coupl\$ or bind or bond\$)) same substrate same (silicon or (silicon with nitride) or (ultraflat with glass) or gold)	5
		<i>DB=USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L1	(polylysine with coupl\$) same substrate same (silicon or (silicon with nitride) or (ultraflat with glass) or gold)	0

END OF SEARCH HISTORY

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NEWS 4 APR 04 STN AnaVist \$500 visualization usage credit offered  
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NEWS 7 MAY 19 Derwent World Patents Index to be reloaded and enhanced.  
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NEWS 9 MAY 30 The F-Term thesaurus is now available in CA/CAPLUS  
NEWS 10 JUN 02 The first reclassification of IPC codes now complete in  
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NEWS 11 JUN 26 TULSA/TULSA2 reloaded and enhanced with new search and  
and display fields  
NEWS 12 JUN 28 Price changes in full-text patent databases EPFULL and PCTFULL  
NEWS 13 JUL 11 CHEMSAFE reloaded and enhanced  
NEWS 14 JUL 14 FSTA enhanced with Japanese patents  
NEWS 15 JUL 19 Coverage of Research Disclosure reinstated in DWPI  
  
NEWS EXPRESS JUNE 30 CURRENT WINDOWS VERSION IS V8.01b, CURRENT  
MACINTOSH VERSION IS V6.0c(ENG) AND V6.0Jc(JP),  
AND CURRENT DISCOVER FILE IS DATED 26 JUNE 2006.  
  
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FILE 'HOME' ENTERED AT 16:27:05 ON 06 AUG 2006

=> fil medline biosis caplus scisearch embase wpids

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FULL ESTIMATED COST	0.21	0.21

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=> (mercaptoundeconic or mercaptoundecanoic) and gold and cluster  
L1 44 (MERCAPTOUNDECONIC OR MERCAPTOUNDECANOIC) AND GOLD AND CLUSTER

=> dup rem l1  
PROCESSING COMPLETED FOR L1  
L2 37 DUP REM L1 (7 DUPLICATES REMOVED)

=> t ti l2 1-37

L2 ANSWER 1 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on  
STN

TI Covalently networked monolayer-protected nanoparticle films

L2 ANSWER 2 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on  
STN

TI Synthesis, characterization of dihydrolipoic acid capped gold  
nanoparticles, and functionalization by the electroluminescent luminol

L2 ANSWER 3 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Convergent synthesis of dendron-functionalized gold  
nanoparticles

L2 ANSWER 4 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 1

TI Mechanisms of secondary ion emission from self-assembled monolayers and  
multilayers

L2 ANSWER 5 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Ultra-fast formation and characterization of stable nanoparticle film  
assemblies

L2 ANSWER 6 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Nanoparticle-structured sensing array materials and pattern recognition  
for VOC detection

L2 ANSWER 7 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Nanogold synthesis by inert gas condensation for immuno-chemistry probes

L2 ANSWER 8 OF 37 WPIDS COPYRIGHT 2006 THE THOMSON CORP on STN

TI Catalytic composition, e.g. useful for oxidation of carbon monoxide,  
comprises catalytic metal cluster distributed in calcined  
mesoporous gel that has three-dimensional nanostructure.

L2 ANSWER 9 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Electron Hopping Dynamics in Monolayer-Protected Au Cluster Network Polymer Films by Rotated Disk Electrode Voltammetry

L2 ANSWER 10 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

TI Construction and electrochemical characteristics of multilayer assemblies of Au nanoclusters protected by mixed self-assembled monolayers on tin-doped indium oxide

L2 ANSWER 11 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 2

TI Photogeneration of a diene template for surface Diels-Alder reactions: Photoenolization of an ortho-methyl-benzophenone-modified Au cluster

L2 ANSWER 12 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

TI HPLC of monolayer-protected gold nanoclusters

L2 ANSWER 13 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

TI X-ray photoelectron spectroscopic study of the activation of molecularly-linked gold nanoparticle catalysts

L2 ANSWER 14 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Growth, conductivity, and vapor response properties of metal ion-carboxylate linked nanoparticle films

L2 ANSWER 15 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Quantized Double-Layer Charging of Highly Monodisperse Metal Nanoparticles

L2 ANSWER 16 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

TI Interfacial mass flux at 11-mercaptopundecanoic acid linked nanoparticle assembly on electrodes

L2 ANSWER 17 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 3

TI Dynamics of Electron Transfers between Electrodes and Monolayers of Nanoparticles

L2 ANSWER 18 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Highly reactive intermediate-functionalized gold clusters: synthesis and immobilization on silica supports through amide-forming coupling

L2 ANSWER 19 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

TI Electron and ion transfer through multilayers of gold nanoclusters covered by self-assembled monolayers of alkylthiols with various functional groups

L2 ANSWER 20 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Growth and conductivity of monolayer protected cluster films - new strategies

L2 ANSWER 21 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Scaffold-organized cluster formation and nanoelectronic devices made using such clusters

L2 ANSWER 22 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI The Dynamics of Electron Self-Exchange between Nanoparticles

L2 ANSWER 23 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on

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TI Core-shell nanostructured nanoparticle films as chemically sensitive interfaces

L2 ANSWER 24 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

TI Chain length dependence and sensing capabilities of the localized surface plasmon resonance of silver nanoparticles chemically modified with alkanethiol self-assembled monolayers

L2 ANSWER 25 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

TI Quartz-crystal microbalance and spectrophotometric assessments of inter-core and inter-shell reactivities in nanoparticle thin film formation and growth

L2 ANSWER 26 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Redox and Double-Layer Charging of Phenothiazine Functionalized Monolayer-Protected Clusters

L2 ANSWER 27 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN DUPLICATE 4

TI Labelling and binding of poly-(L-lysine) to functionalised gold surfaces. Combined FT-IRRAS and XPS characterisation

L2 ANSWER 28 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Monolayer-Protected Clusters: Molecular Precursors to Metal Films

L2 ANSWER 29 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

TI Electroactivity Of Cu<sup>2+</sup> at a thin film assembly of gold nanoparticles linked by 11-mercaptoundecanoic acid

L2 ANSWER 30 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Mercaptoammonium-Monolayer-Protected, Water-Soluble Gold, Silver, and Palladium Clusters

L2 ANSWER 31 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Controlled and Reversible Formation of Nanoparticle Aggregates and Films Using Cu<sup>2+</sup>-Carboxylate Chemistry

L2 ANSWER 32 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Monolayer-Protected Clusters with Fluorescent Dansyl Ligands

L2 ANSWER 33 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Quantized Double Layer Charging of Nanoparticle Films Assembled Using Carboxylate/(Cu<sup>2+</sup> or Zn<sup>2+</sup>)/Carboxylate Bridges

L2 ANSWER 34 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 5

TI A self assembled shell of 11-mercaptoundecanoic aminophenylboronic acids on gold nanoclusters

L2 ANSWER 35 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Scaffold-organized metal, alloy, semiconductor, and/or magnetic clusters and electronic devices made using such clusters

L2 ANSWER 36 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

TI Gateway Reactions to Diverse, Polyfunctional Monolayer-Protected Gold Clusters

L2 ANSWER 37 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 6

TI Direct electron transfer of adrenodoxin-a [2Fe-2S] protein- and its

mutants at modified gold electrode

=> d ibib abs 12 1-37

L2 ANSWER 1 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

ACCESSION NUMBER: 2005:1169528 SCISEARCH

THE GENUINE ARTICLE: 985IQ

TITLE: Covalently networked monolayer-protected nanoparticle films

AUTHOR: Tognarelli D J; Miller R B; Pompano R R; Loftus A F; Sheibley D J; Leopold M C (Reprint)

CORPORATE SOURCE: Univ Richmond, Dept Chem, Gottwald Sci Ctr, Richmond, VA 23173 USA (Reprint)  
mleopold@richmond.edu

COUNTRY OF AUTHOR: USA

SOURCE: LANGMUIR, (22 NOV 2005) Vol. 21, No. 24, pp. 11119-11127.  
ISSN: 0743-7463.

PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036 USA.

DOCUMENT TYPE: Article; Journal

LANGUAGE: English

REFERENCE COUNT: 45

ENTRY DATE: Entered STN: 1 Dec 2005

Last Updated on STN: 3 Aug 2006

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Covalently networked films of nanoparticles can be assembled on various substrates from functionalized monolayer-protected clusters (MPCs) via ester coupling reactions. Exposure of a specifically modified substrate to alternating solutions of 11-mercaptoundecanoic acid exchanged and 11-mercaptoundecanol exchanged MPCs, in the presence of ester coupling reagents, 1,3-dicyclohexylcarbodiimide and 4-(dimethylamino)pyridine, results in the formation of a multilayer film with ester bridges between individual nanoparticles. These films can be grown in a controlled manner to various thicknesses and exhibit certain properties that are consistent with films having other types of interparticle connectivity, including chemical vapor response behavior and quantized double layer charging. Ester coupling of MPCs into assembled films is a straightforward and highly versatile approach that results in robust films that can endure harsher chemical environments than other types of films. The stability of these covalent films is assessed and compared to other more traditional MPC film assemblies.

L2 ANSWER 2 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

ACCESSION NUMBER: 2005:305186 SCISEARCH

THE GENUINE ARTICLE: 905OP

TITLE: Synthesis, characterization of dihydrolipoic acid capped gold nanoparticles, and functionalization by the electroluminescent luminol

AUTHOR: Roux S (Reprint); Garcia B; Bridot J L; Salome M; Marquette C; Lemelle L; Gillet P; Blum L; Perriat P; Tillement O

CORPORATE SOURCE: Univ Lyon 1, CNRS, UMR 5620, Lab Physicochim Mat Luminescents, Domaine Sci Doua, F-69622 Villeurbanne, France (Reprint); Univ Lyon 1, CNRS, UMR 5620, Lab Physicochim Mat Luminescents, F-69622 Villeurbanne, France; Ecole Normale Super Lyon, CNRS, UMR 5570, Lab Sci Terre, F-69007 Lyon, France; ESRF, F-38042 Grenoble, France; Univ Lyon 1, CNRS, UMR 5013, Lab Genie Enzymat & Biomol, F-69622 Villeurbanne, France; Inst Natl Sci Appl,



CNRS, UMR 5510, Grp Etud Met Phys & Phys Mat, F-69621  
Villeurbanne, France  
roux@pcml.univ-lyon1.fr

COUNTRY OF AUTHOR: France  
SOURCE: LANGMUIR, (15 MAR 2005) Vol. 21, No. 6, pp. 2526-2536.  
ISSN: 0743-7463.  
PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036  
USA.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 72  
ENTRY DATE: Entered STN: 24 Mar 2005  
Last Updated on STN: 24 Mar 2005

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB The use of gold nanoparticles as biological probes requires the improvement of colloidal stability. Dihydrolipoic acid (DHLA), a dithiol obtained by the reduction of thiocetic acid, appears therefore very attractive for the stabilization and the further functionalization of gold nanoparticles because DHLA is characterized by a carboxylic acid group and two thiol functions. The ionizable carboxylic acid groups ensure, for pH 1-8, the water solubility of DHLA-capped gold (Au@DHLA) nanoparticles, prepared by the Brust protocol, and the stability of the resulting colloid by electrostatic repulsions. Moreover almost all DHLA, adsorbed onto gold, adopts a conformation allowing their immobilization by both sulfur ends. It is proved by sulfur K-edge X-ray absorption near edge structure spectroscopy, which appears as an appropriate tool for determining the chemical form of sulfur atoms present in the organic monolayer. Such a grafting renders the DHLA monolayers more resistant to displacement by dithiothreitol than mercaptoundecanoic acid monolayers. The presence of DHLA on gold particles allows their functionalization by the electroluminescent luminol through amine coupling reactions assisted by 1-(3-dimethylaminopropyl)3-ethylcarbodiimide hydrochloride and N-hydroxysuccinimide. As a luminol-functionalized particle is nine times as bright as a single luminol molecule, the use of the particles as a biological probe with a lower threshold of detection is envisaged.

L2 ANSWER 3 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:733829 CAPLUS  
DOCUMENT NUMBER: 143:196192  
TITLE: Convergent synthesis of dendron-functionalized gold nanoparticles  
AUTHOR(S): Choi, Daeock; Chinn, Laura; Shon, Young-Seok  
CORPORATE SOURCE: Department of Chemistry, Sunchon National University, Suncheon, 540-742, S. Korea  
SOURCE: PMSE Preprints (2005), 93, 739-740  
CODEN: PPMRA9; ISSN: 1550-6703  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal; (computer optical disk)  
LANGUAGE: English

AB Hexanethiolate/11-mercaptoundecanoic acid gold clusters were prepared and coupled with allyloxy functionalized benzyl alc. based dendrons. The resulting nanoparticle-cored dendrimers (NCDs) were characterized by NMR and FT-IR.

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 4 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 1

ACCESSION NUMBER: 2005:996586 CAPLUS  
DOCUMENT NUMBER: 144:319384  
TITLE: Mechanisms of secondary ion emission from self-assembled monolayers and multilayers

AUTHOR(S): Wong, Stephen C. C.; Lockyer, Nicholas P.; Vickerman, John C.  
CORPORATE SOURCE: Surface Analysis Research Centre, School of Chemical Engineering and Analytical Science, University of Manchester, Manchester, M60 1QD, UK  
SOURCE: Surface and Interface Analysis (2005), 37(9), 721-730  
CODEN: SIANDQ; ISSN: 0142-2421  
PUBLISHER: John Wiley & Sons Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Alkanethiol self-assembled monolayers/multilayers (SAMs) were applied as model organic systems with which to study secondary ion formation and emission processes during kiloelectronvolt ion bombardment. Self-assembled monolayer and multilayer films of 11-mercaptopundecanoic acid capped with 1-dodecanethiol were prepared on Au-coated substrates. Samples with varying number of thiolate layers were studied using static secondary ion mass spectrometry to study the origin of mol. secondary ions and the influence of surface chemical and structure. The nature of the thiolate bonding affects the type and abundance of the observed ions. The intensity of atomic and cluster ions derived from the substrate decreases exponentially with increasing number of thiolate overlayers because of losses in transmission through the organic overlayers. Intact mol. and cluster ions can escape from > 100 Å below the surface of these structures. The variation of mol.-ion yields with multilayer thickness suggests that a significant proportion of mol. ions originate from subsurface thiolate layers. The detection of ions comprised species from the substrate or bottom of the multilayer associated with species from the top layer supports the view that chemical association at or near the surface is a viable mechanism of formation for mol. secondary ions.

REFERENCE COUNT: 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 5 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:49505 CAPLUS  
DOCUMENT NUMBER: 142:304265  
TITLE: Ultra-fast formation and characterization of stable nanoparticle film assemblies  
AUTHOR(S): Sheibley, Dan; Tognarelli, D. J.; Szymanik, Renee; Leopold, Michael C.  
CORPORATE SOURCE: Department of Chemistry, Gottwald Science Center, University of Richmond, Richmond, VA, 23173, USA  
SOURCE: Journal of Materials Chemistry (2005), 15(4), 491-498  
CODEN: JMACEP; ISSN: 0959-9428  
PUBLISHER: Royal Society of Chemistry  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Novel assembled films of monolayer-protected clusters (MPCs) can be grown on gold and glass substrates with a 20-fold higher efficiency than established procedures. Thick MPC films grown using this new method, which can easily be scaled up or automated, are extremely stable and have properties identical to traditionally formed nanoparticle films, including unique quantized double layer charging effects. This new procedure for growing nanoparticle films shares the versatility of the traditional method but exhibits accelerated growth attributed to highly efficient sorption and mobility of metal ion linkers within swelled films and improved mass transfer of nanoparticles to assembly sites. Concentration and pH effects on the mechanism of film growth are shown to have substantial impact on the efficiency.

REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS

L2 ANSWER 6 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:335185 CAPLUS

DOCUMENT NUMBER: 143:108624

TITLE: Nanoparticle-structured sensing array materials and pattern recognition for VOC detection

AUTHOR(S): Han, Li; Shi, Xiajing; Wu, Wendy; Kirk, F. Louis; Luo, Jin; Wang, Lingyan; Mott, Derrick; Cousineau, Lisa; Lim, Stephanie I-Im; Lu, Susan; Zhong, Chuan-Jian

CORPORATE SOURCE: Department of Chemistry, State University of New York at Binghamton, Binghamton, NY, 13902, USA

SOURCE: Sensors and Actuators, B: Chemical (2005), B106(1), 431-441

CODEN: SABCEB; ISSN: 0925-4005

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Nanostructured sensing arrays combined with pattern-recognition anal. provide new opportunities for enhancing the design of sensor materials in terms of sensitivity and selectivity. The authors report findings of a study of nanostructured sensing arrays for the detection of volatile organic compds. (VOCs) and nitro-aromatic compds. (NACs) and the data anal. based on pattern recognition using principal component anal. (PCA) and artificial neural networks (ANN) techniques. The nanostructured array elements consist of thin film assemblies of alkanethiolate-monolayer-capped gold nanoparticles which were formed by molecularly mediated assembly using mediators or linkers of different chain lengths and functional groups. Each array element displayed linear responses to the vapor concentration. The observed high specificity to NACs constitutes an unprecedented example resulting from the unique combination of hydrogen-bonding donor/acceptor and hydrophobicity in the interparticle structure. A set of ANNs along with PCAs was used for the anal. of vapor responses. The PCA technique was used to cluster data and feature extraction. A hierarchical BP neural network system was employed as the pattern classifier, which was shown to enhance the correct pattern-recognition rate. A satisfactory identification performance of the system was demonstrated for a set of vapor responses. The results also provided the authors important insights into the delineation of the design criteria for constructing nanostructured sensing arrays.

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 7 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2005:109632 CAPLUS

DOCUMENT NUMBER: 143:208476

TITLE: Nanogold synthesis by inert gas condensation for immuno-chemistry probes

AUTHOR(S): Lee, Kwang-Min; Park, Sung-Tae; Lee, Doh-Jae

CORPORATE SOURCE: Department of Materials Science and Engineering and Nano Technology Research Center, Chonnam National University, Gwangju, 500-757, S. Korea

SOURCE: Journal of Alloys and Compounds (2005), 390(1-2), 297-300

CODEN: JALCEU; ISSN: 0925-8388

PUBLISHER: Elsevier B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Nanogold clusters synthesized through a chemical process involving 11 or 55 atoms of gold have been widely used for immuno-chemical probes, in the form of nanoclusters conjugated with biomols. The creation of 1 nm size nanogold particles by a materials engineering process has been

largely undeveloped. Therefore, the objective of this study is to minimize the size of gold nanoparticle by means of controlling the operating temperature and the chamber pressure during inert gas condensation processing. The size of the gold nanoparticles was resultant of the processing conditions such as the evaporation temps. and chamber pressures. At a temperature of 1124 °C and pressure of 133 Pa, we were able to obtain approx. 1 nm size nanogold particles.

REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 8 OF 37 WPIDS COPYRIGHT 2006 THE THOMSON CORP on STN  
ACCESSION NUMBER: 2004-661519 [64] WPIDS  
DOC. NO. CPI: C2004-236160  
TITLE: Catalytic composition, e.g. useful for oxidation of carbon monoxide, comprises catalytic metal cluster distributed in calcined mesoporous gel that has three-dimensional nanostructure.  
DERWENT CLASS: E36 J04  
INVENTOR(S): PIETRON, J; ROLISON, D; STROUD, R  
PATENT ASSIGNEE(S): (PIET-I) PIETRON J; (ROLI-I) ROLISON D; (STRO-I) STROUD R; (USNA) US SEC OF NAVY  
COUNTRY COUNT: 1  
PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
US 2004180787	A1	20040916	(200464)*		9
US 7081433	B2	20060725	(200649)		

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
US 2004180787	A1	US 2003-390257	20030312
US 7081433	B2	US 2003-390257	20030312

PRIORITY APPLN. INFO: US 2003-390257 20030312

AN 2004-661519 [64] WPIDS

AB US2004180787 A UPAB: 20041006

NOVELTY - A catalytic composition comprises a catalytic metal cluster distributed in a calcined mesoporous gel. The gel is either aerogel or ambigel; and has a three-dimensional nanostructure.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for synthesis of the catalytic mesoporous gel, which involves:

- (1) forming a monolayer-protected cluster or ligand-stabilized colloid of the catalytic metal;
- (2) forming a metal oxide sol;
- (3) mixing the monolayer-protected cluster or ligand-stabilized colloid of the catalytic metal with the metal oxide sol, and allowing the sol to form gel;
- (4) either extracting the gel with supercritical carbon dioxide to form the aerogel; or rinsing the gel with a low-surface-tension solvent followed by drying the gel by evaporating the solvent to form the ambigel; and
- (5) calcining the resultant aerogel or ambigel.

The sol of the metal oxide and the cluster or colloid of the catalytic metal can be alternatively obtained by mixing together the monolayer-protected cluster or ligand-stabilized colloid and a metal oxide precursor. The precursor is converted to the metal oxide.

USE - For oxidation of carbon monoxide, olefin epoxidation and sulfur

oxidation.

ADVANTAGE - The three-dimensional continuous mesoporous network enables rapid diffusion of reactant to active sites in the aerogel, such that mass transport occurs on the order of open-medium diffusion rates. The gel composite provides three-dimensional design and application flexibility through the bicontinuity of the nanoscopic networks of catalyst and mesopores, and retains high activity of the metal, even though it is in the form of nanoparticles.  
Dwg.0/3

L2 ANSWER 9 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2004:690822 CAPLUS

DOCUMENT NUMBER: 141:339146

TITLE: Electron Hopping Dynamics in Monolayer-Protected Au Cluster Network Polymer Films by Rotated Disk Electrode Voltammetry

AUTHOR(S): Brennan, Jennifer L.; Branham, Matthew R.; Hicks, Jocelyn F.; Osisek, Andrea J.; Donkers, Robert L.; Georganopoulou, Dimitra G.; Murray, Royce W.

CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA

SOURCE: Analytical Chemistry (2004), 76(19), 5611-5619  
CODEN: ANCHAM; ISSN: 0003-2700

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Electrons are transported within polymeric films of alkanethiolate monolayer-protected Au clusters (MPCs) by electron hopping (self-exchange) between the metal cores. The surrounding monolayers, the mol. linkers that generate the network polymer film, or both, presumably serve as tunneling bridges in the electron transfers. This paper introduces a steady-state electrochem. method for measuring electron hopping rates in solvent-wetted and swollen, ionically conductive MPC films. The films are network polymer films of nanoparticles, coated on a rotated disk electrode that is contacted by a solution of a redox species (decamethylferrocene, Cp\*Fe). Controlling the electrode potential such that the film mediates oxidation of the redox probe can force control of the overall current onto the rate of electron hopping within the film, which is characterized as the apparent electron diffusion coefficient DE. DE is translated into an apparent electron hopping rate kET by a cubic lattice model. The experiment is applied to MPC network polymer films linked by  $\alpha,\omega$ -alkanedithiolates and by metal ion-carboxylate connections. The authors evaluate the dependencies of apparent hopping rate on Cp\*Fe concentration, film thickness, electrode potential relative to the Cp\*Fe formal potential, film-swelling solvent, and temperature. The apparent hopping rates are in the 104-105 s<sup>-1</sup> range, which is slower than those for the same kind of MPC films, but in a dry (nonswollen) state measured by electronic conductivities.

REFERENCE COUNT: 86 THERE ARE 86 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 10 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

ACCESSION NUMBER: 2003:1100770 SCISEARCH

THE GENUINE ARTICLE: 751HL

TITLE: Construction and electrochemical characteristics of multilayer assemblies of Au nanoclusters protected by mixed self-assembled monolayers on tin-doped indium oxide

AUTHOR: Song W B; Okamura M; Kondo T; Uosaki K (Reprint)

CORPORATE SOURCE: Hokkaido Univ, Grad Sch Sci, Div Chem, Chem Phys Lab, Sapporo, Hokkaido 0600810, Japan (Reprint)

COUNTRY OF AUTHOR: Japan

SOURCE: PHYSICAL CHEMISTRY CHEMICAL PHYSICS, (1 DEC 2003) Vol. 5,  
No. 23, pp. 5279-5284.  
ISSN: 1463-9076.  
PUBLISHER: ROYAL SOC CHEMISTRY, THOMAS GRAHAM HOUSE, SCIENCE PARK,  
MILTON RD, CAMBRIDGE CB4 0WF, CAMBS, ENGLAND.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 40  
ENTRY DATE: Entered STN: 26 Dec 2003  
Last Updated on STN: 26 Dec 2003

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB The electrochemical characteristics of multilayers of gold nanoclusters (GNCs) on a tin-doped indium oxide (ITO) electrode were investigated and were compared with those of GNC multilayers on an An (111) surface. Two types of GNC, one covered by self-assembled monolayers (SAMs) of mercaptoundecanoic acid (MUA), hexanethiol (C6SH), and ferrocenylhexanethiol (FcC(6)SH), MHF-GNC, and the other covered by MUA and C6SH, MH-GNC, were consecutively deposited with an ionic polymer (poly(allylamine hydrochloride) (PAH)) binding layer based on an electrostatic principle. At the ITO electrode modified with multilayers composed only with MHF-GNC, a reversible wave corresponding to the redox of the ferrocene group was observed at +350 mV. The full width at half maximum (fwhm) of the redox peak was much narrower than that expected for a simple Langmuir-type redox process, which was observed on the MHF-GNC-modified An (111) surface, suggesting a strong interaction between the ferrocene groups on the GNC within the multilayer on the ITO electrode. The transfers of both electrons and perchlorate ions through these GNC multilayers were found to be rather facile. The amount of deposited GNC of the multilayers on the ITO substrate was 5-times greater than that on An (111). This discrepancy was attributed to the different GNC arrangements in the multilayers on the two substrates. The substrate effect on GNC multilayer formation is also discussed.

L2 ANSWER 11 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 2

ACCESSION NUMBER: 2003:613312 CAPLUS  
DOCUMENT NUMBER: 139:291862  
TITLE: Photogeneration of a diene template for surface  
Diels-Alder reactions: Photoenolization of an  
ortho-methyl-benzophenone-modified Au cluster  
AUTHOR(S): Kell, Arnold J.; Montcalm, Christopher C.; Workentin,  
Mark S.  
CORPORATE SOURCE: Department of Chemistry, The University of Western  
Ontario, London, ON, N6A 5B7, Can.  
SOURCE: Canadian Journal of Chemistry (2003), 81(6), 484-494  
CODEN: CJCHAG; ISSN: 0008-4042  
PUBLISHER: National Research Council of Canada  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
OTHER SOURCE(S): CASREACT 139:291862

AB A series of monolayer-protected clusters (MPCs) modified with a photoreactive [4-(11-mercaptoundecyl)-phenyl](2-methylphenyl)methanone (1) moiety have been prepared where 1 is co-absorbed to the MPC surface with dodecanethiol, octadecanethiol, or 11-mercaptoundecanoic acid Me ester. Upon irradiation the MPC-anchored 1 reacts efficiently through its triplet excited states, yielding 1,4-biradicals that collapse to synthetically useful, long-lived photodienol intermediates, which can be efficiently trapped in Diels-Alder type chemical by dienophiles - namely, di-Me acetylenedicarboxylate (DMAD). In all cases the Diels-Alder trapping of the dienol occurred efficiently resulting in >60% conversion to the Diels-Alder adduct. This indicates that the local environment surrounding 1 did not influence its ability to react via the Diels-Alder reaction; however, the reaction could not be taken to completion. The

inability to react completely is attributed to 1 binding to distinct sites on the MPC core; there are edge, vertex, and terrace sites. Selective population of these specific sites and the subsequent irradiations show that MPCs with 1 anchored predominantly at edge and vertex sites results in an extent of reaction of  $85 \pm 3\%$ , whereas selectively populating the terrace sites results in an extent of reaction of  $36 \pm 2\%$ . These results suggest that 1 anchored to edge and vertex sites is more reactive to the Diels-Alder reaction than that involving terrace sites.

REFERENCE COUNT: 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 12 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

ACCESSION NUMBER: 2003:89464 SCISEARCH  
THE GENUINE ARTICLE: 6352M  
TITLE: HPLC of monolayer-protected gold nanoclusters  
AUTHOR: Jimenez V L; Leopold M C; Mazzitelli C; Jorgenson J W; Murray R W (Reprint)  
CORPORATE SOURCE: Univ N Carolina, Kenan Labs Chem, CB-3290, Chapel Hill, NC 27599 USA (Reprint); Univ N Carolina, Kenan Labs Chem, Chapel Hill, NC 27599 USA  
COUNTRY OF AUTHOR: USA  
SOURCE: ANALYTICAL CHEMISTRY, (15 JAN 2003) Vol. 75, No. 2, pp. 199-206.  
ISSN: 0003-2700.  
PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036 USA.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 48  
ENTRY DATE: Entered STN: 7 Feb 2003  
Last Updated on STN: 7 Feb 2003

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Polydisperse samples of Au nanoparticles protected with monolayers of hexanethiolate ligands (C6 MPCs) and with mixed monolayers of hexanethiolate and mercaptoundecanoic acid (C6/MUA MPCs) have been chromatographically separated using C8 120-Angstrom columns and acetone/toluene mobile phase. The spectral details of eluted peaks and of quantized double-layer charging features in the differential pulse voltammetry of collected fractions were used to show that the elution orders of C6 MPC mixtures and of C6/MUA MPC mixtures were different. For C6 MPCs, the smallest MPCs were eluted first, whereas the smallest C6/MUA MPCs were eluted last. The reversal of order of elution was rationalized in terms of intermolecular interactions with the stationary phase, dominant for the C6 MPC, being suppressed by the heightened polarity of the monolayer surface of the C6/MUA MPCs, making a size exclusion mechanism dominant. The range of apparent core diameters of the separated nanoparticles was 1.3-2 nm.

L2 ANSWER 13 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

ACCESSION NUMBER: 2003:81457 SCISEARCH  
THE GENUINE ARTICLE: 634GW  
TITLE: X-ray photoelectron spectroscopic study of the activation of molecularly-linked gold nanoparticle catalysts  
AUTHOR: Maye M M; Luo J; Lin Y H; Engelhard M H; Hepel M; Zhong C J (Reprint)  
CORPORATE SOURCE: SUNY Binghamton, Dept Chem, Binghamton, NY 13902 USA (Reprint); Pacific NW Natl Lab, Environm & Mol Sci Lab, Richland, WA 99352 USA; SUNY Coll Potsdam, Dept Chem, Potsdam, NY 13676 USA

COUNTRY OF AUTHOR: USA  
SOURCE: LANGMUIR, (7 JAN 2003) Vol. 19, No. 1, pp. 125-131.  
ISSN: 0743-7463.  
PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036  
USA.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 39  
ENTRY DATE: Entered STN: 31 Jan 2003  
Last Updated on STN: 31 Jan 2003

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB This paper reports the results of a study on the activation of core-shell assembled gold nanoparticle catalysts using X-ray photoelectron spectroscopy (XPS). The goal is to determine the surface reconstitution of the nanostructured catalysts upon electrochemical activation for the electrocatalytic oxidation of methanol. The decanethiolate-capped gold nanoparticles of 2-5 nm core sizes were assembled as catalyst thin films on electrode surfaces using 1,9-nonanedithiol and 11-mercaptoundecanoic acid as model molecular linkers. The XPS results have provided two important insights into the surface reconstitution of the activated nanostructure. First, the capping/linking thioliates or dithioliates are partially removed to produce the catalytic access, with the degree of removal being dependent on the nature of the molecular linker. Second, oxygenated species are detected on the activated gold nanocrystals, demonstrating the formation of surface gold oxide and its participation in the electrocatalytic oxidation of methanol. The findings are also correlated with results from studies of surface microscopic morphology and interfacial mass flux and provide further insights into issues related to the design and preparation of highly active nanostructured gold catalysts.

L2 ANSWER 14 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:933522 CAPLUS  
DOCUMENT NUMBER: 140:345410  
TITLE: Growth, conductivity, and vapor response properties of metal ion-carboxylate linked nanoparticle films  
AUTHOR(S): Leopold, Michael C.; Donkers, Robert L.;  
Georganopoulou, Dimitra; Fisher, Megan; Zamborini,  
Francis P.; Murray, Royce W.  
CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North  
Carolina, Chapel Hill, NC, 27599-3290, USA  
SOURCE: Faraday Discussions (2003), Volume Date 2004, 125,  
63-76  
CODEN: FDIS6; ISSN: 1359-6640  
PUBLISHER: Royal Society of Chemistry  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Nanoparticles of metals (Au, Ag, Pd, alloys) in the size range 1-3 nm diameter can be stabilized against aggregation of the metal particles by coating the metal surface with a dense monolayer of ligands (thioliates). The stabilization makes it possible to anal. define the nanoparticle composition (for example, Au<sub>140</sub>(hexanethiolate)<sub>53</sub>, I) and to elaborate the chemical functionality of the protecting monolayer (for example, Au<sub>140</sub>(C6)<sub>35</sub>(MUA)<sub>18</sub>, II, where C6 = hexanethiolate and MUA = mercaptoundecanoic acid). Network polymer films (IIfilm) on interdigitated array electrodes can be prepared from II, based on cation coordination (i.e., Cu<sup>2+</sup>, Zn<sup>2+</sup>, Ag<sup>+</sup>, Me viologen) by the carboxylates of MUA. The electronic conductivity of the IIfilm network polymer films occurs by electron hopping between the Au<sub>140</sub> nanoparticle cores, and offers an avenue for study of metal-to-metal nanoparticle electron transfer chemical. The report begins with a brief summary of what is known about metal



nanoparticle electron transfer chemical The study goes on to assess factors that influence the dynamics of film formation as well as film conductivity, in the interest of better understanding the parameters affecting electron hopping rates in IIfilm network polymer films. Finally, sorption of organic vapors into IIfilm causes a decreased electronic conductivity and increased mass

that can be assessed using quartz crystal microbalance measurements. The change in electronic conductivity can be exploited for the sensing of organic vapors.

REFERENCE COUNT: 54 THERE ARE 54 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 15 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:779205 CAPLUS

DOCUMENT NUMBER: 138:9248

TITLE: Quantized Double-Layer Charging of Highly Monodisperse Metal Nanoparticles

AUTHOR(S): Hicks, Jocelyn F.; Miles, Deon T.; Murray, Royce W.

CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina CB3290, Chapel Hill, NC, 27599-3290, USA

SOURCE: Journal of the American Chemical Society (2002), 124(44), 13322-13328

CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The authors describe unprecedented resolution of electrochem. observed quantized

double layer (QDL) charging, attained using reduced solution temps. and with an annealing procedure that produces hexanethiolate monolayer protected Au clusters (C6 MPCs) with a high level of monodispersity in charging capacitance, CCLU. The spacing  $\Delta V = e/CCLU$  on the electrochem. potential axis between single electron changes in the electronic charge of nanoscopic metal particles is determined by their effective capacitance CCLU. The high monodispersity of the C6 MPCs with Au<sub>140</sub> cores facilitates (a) detailed rotated disk and cyclic voltammetric measurements, (b) simulation of QDL wave shapes based on assumed reversible, multivalent redox-like behavior, (c) determination of nanoparticle diffusion rates, and (d)

observation

of as many as 13 changes in the MPC charge state, from MPC<sub>6</sub>- to MPC<sub>7</sub>+. The single electron QDL charging peaks are quite evenly spaced ( $\Delta V$  constant) at potentials near the MPC potential of zero charge, but are irregularly spaced at more pos. and neg. potentials. The irregular spacing is difficult to rationalize with classical double layer capacitance ideas and is proposed to arise from a correspondingly structured (e.g., not smooth) d. of electronic states of the nanoparticle core, resulting from its small HOMO/LUMO gap and incipiently mol.-like behavior.

REFERENCE COUNT: 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 16 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

ACCESSION NUMBER: 2002:762428 SCISEARCH

THE GENUINE ARTICLE: 591JR

TITLE: Interfacial mass flux at 11-mercaptoundecanoic acid linked nanoparticle assembly on electrodes

AUTHOR: Luo J; Kariuki N; Han L; Maye M M; Moussa L W; Kowaleski S R; Kirk F L; Hepel M; Zhong C J (Reprint)

CORPORATE SOURCE: SUNY Binghamton, Dept Chem, Binghamton, NY 13902 USA (Reprint); SUNY Coll Potsdam, Dept Chem, Potsdam, NY 13676 USA

COUNTRY OF AUTHOR: USA  
SOURCE: JOURNAL OF PHYSICAL CHEMISTRY B, (12 SEP 2002) Vol. 106,  
No. 36, pp. 9313-9321.  
ISSN: 1520-6106.  
PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036  
USA.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 62  
ENTRY DATE: Entered STN: 4 Oct 2002  
Last Updated on STN: 4 Oct 2002

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Thin films derived from nanocrystal cores and functionalized linkers provide a large surface area-to-volume ratio and three-dimensional ligand framework. This paper describes the results of an investigation of the interfacial mass flux and binding properties of such thin films using an electrochemical quartz crystal nanobalance technique. The hydrogen-bonding assembly from gold nanocrystals and 11-mercaptopundecanoic acid was studied as a model system. The results reveal four distinctive mass response characteristics upon pH tuning or metal ion binding. First, the protonation-deprotonation characteristic of the carboxylic acid groups in the nanostructured framework is dependent on particle core size and film thickness. Second, the pH-tunable cationic redox reaction across the electrode\film\electrolyte interface is accompanied by a large cationic electrolyte mass flux. Third, the spontaneous complexation to copper ions by the nanostructured carboxylate framework is reflected by a mass increase of the film. Fourth, the redox reaction of copper loaded in the nanostructured film is accompanied by fluxes of electrolyte cations across the electrode\film\electrolyte interface which compensate electrostatically the fixed negative charges. On the basis of the mass change detected in the presence of a series of electrolyte cations, a linear relationship was determined between the mass increase and the atomic mass of the cation, and a concurrent flux of solvent molecules was also revealed. Implications of the findings to the delineation of the design parameters of the nanostructured ligand framework for controlled release and environmental monitoring or removal of metals are also discussed.

L2 ANSWER 17 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 3  
ACCESSION NUMBER: 2002:534470 CAPLUS  
DOCUMENT NUMBER: 137:238995  
TITLE: Dynamics of Electron Transfers between Electrodes and Monolayers of Nanoparticles  
AUTHOR(S): Hicks, Jocelyn F.; Zamborini, Francis P.; Murray, Royce W.  
CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA  
SOURCE: Journal of Physical Chemistry B (2002), 106(32), 7751-7757  
CODEN: JPCBFK; ISSN: 1089-5647  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB This paper describes measurements of the rate of electron transfers between electrodes and attached monolayers of gold nanoparticles (monolayer-protected clusters, MPCs). The Au cores have an average 1.6 nm diameter, and possess a mixed monolayer of hexanethiolate and mercaptopundecanoic acid (MUA) ligands. The nanoparticles are assembled onto Au surfaces coated with a self-assembled MUA monolayer using MUA-carboxylate-zinc ion-MUA-carboxylate bridges. The attached MPC monolayers exhibit well-defined single electron double layer charging

voltammetry of the Au cores. The electron-transfer kinetics of the attached nanoparticles are estimated using cyclic voltammetric, alternating impedance, and potential step techniques. Results from these expts. are consistent with one another and yield heterogeneous electron-transfer rates at 40-160 s<sup>-1</sup>.

REFERENCE COUNT: 47 THERE ARE 47 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 18 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2002:738217 CAPLUS

DOCUMENT NUMBER: 138:45167

TITLE: Highly reactive intermediate-functionalized gold clusters: synthesis and immobilization on silica supports through amide-forming coupling

AUTHOR(S): Akamatsu, Kensuke; Hasegawa, Jun; Nawafune, Hidemi; Katayama, Hiroyuki; Ozawa, Fumiyuki

CORPORATE SOURCE: Faculty of Science and Engineering, High Technology Research Center, Konan University, Higashinada, Kobe, 658-8501, Japan

SOURCE: Journal of Materials Chemistry (2002), 12(10), 2862-2865

CODEN: JMACEP; ISSN: 0959-9428

PUBLISHER: Royal Society of Chemistry

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Gold clusters functionalized with interchain carboxylic anhydride over their entire surface have been successfully immobilized on amine-functionalized silica supports through amide-forming coupling, providing ordered two-dimensional arrangements of cluster monolayers, which might find utility in the development of artificial nanostructures for nanoelectronic device applications.

REFERENCE COUNT: 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 19 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

ACCESSION NUMBER: 2002:668367 SCISEARCH

THE GENUINE ARTICLE: 581GJ

TITLE: Electron and ion transfer through multilayers of gold nanoclusters covered by self-assembled monolayers of alkylthiols with various functional groups

AUTHOR: Uosaki K (Reprint); Kondo T; Okamura M; Song W B

CORPORATE SOURCE: Hokkaido Univ, Grad Sch Sci, Div Chem, Phys Chem Lab, Sapporo, Hokkaido 0600810, Japan (Reprint)

COUNTRY OF AUTHOR: Japan

SOURCE: FARADAY DISCUSSIONS, (2002) Vol. 121, pp. 373-389. ISSN: 1364-5498.

PUBLISHER: ROYAL SOC CHEMISTRY, THOMAS GRAHAM HOUSE, SCIENCE PARK, MILTON RD, CAMBRIDGE CB4 0WF, CAMBS, ENGLAND.

DOCUMENT TYPE: Article; Journal

LANGUAGE: English

REFERENCE COUNT: 83

ENTRY DATE: Entered STN: 30 Aug 2002

Last Updated on STN: 30 Aug 2002

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB The electrochemical characteristics of various kinds of multilayers of gold nanoclusters (GNCs) were investigated. Two types of gold nanoclusters, one covered by self-assembled monolayers (SAMs) of mercaptoundecanoic acid (MUA), hexanethiol (C6SH), and ferrocenylhexanethiol (FcC(6)SH), MHF-GNC, and the other with MUA and C6SH, MH-GNC, were used. The multilayers were constructed on a Au(111) surface based on a carboxylate/metal cation (Cu<sup>++</sup>) /carboxylate or

carboxylate/cationic polymer (poly(allylamine hydrochloride) : PAH)/carboxylate electrostatic interaction. While the multilayers constructed by the former method were stable only in nonaqueous solutions, those constructed by the latter method were stable even in aqueous solutions. Electrochemical measurements of the multilayers of MHF-GNCs showed a pair of waves corresponding to the redox of the ferrocene group around 350-480 mV and the charge of these peaks, i.e., the amount of adsorbed GNC, increased linearly with the construction cycle up to 6 cycles in the former and to 18 cycles in the latter. A rather reversible redox response of the ferrocene moiety was observed even at the gold electrodes with five GNC layers of two different sequences in which MHF-GNC exists as the layer closest to the gold electrode, i.e., the first layer, or as the outermost layer with MH-GNC in the other layers. These results show the facile transfer of electrons and ions through the multilayers of the SAM-covered GNCs and electron transfer between the ferrocene moiety and the Au(111) electrode takes place through the GNC cores by hopping.

L2 ANSWER 20 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2003:683470 CAPLUS

DOCUMENT NUMBER: 139:372452

TITLE: Growth and conductivity of monolayer protected cluster films - new strategies

AUTHOR(S): Donkers, Robert L.; Leopold, Michael C.; Murray, Royce W.

CORPORATE SOURCE: Kenan Laboratories of Chemistry, The University of North Carolina, Chapel Hill, NC, 27599-3290, USA

SOURCE: Proceedings - Electrochemical Society (2002), 2002-10(Organic Electrochemistry), 120-123  
CODEN: PESODO; ISSN: 0161-6374

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The growth and conductivity of assembled films of monolayer protected cluster mols. (MPC) were studied. The nanoparticles used are composed of a 1.6 nm diameter Au core with a surrounding mixed monolayer of alkyl thiolate ligands, including non-linking hexanethiolates and linking carboxylic acid-terminated alkane thiolates. The carboxylate terminated ligands, mercaptoundecanoic acid, were used to tether MPCs to surfaces and bind MPCs to each other via carboxylate-metal ion-carboxylate bridges. Growth favored MPCs with the higher loadings of the linker ligand over all other loadings present during the growth process. Films containing an azobenzene linking ligand were constructed and are more conductive than their alkyl linker counterparts, suggesting that the primary electron transfer (ET) pathway through azobenzene-linked nanoparticles is through the metal-carboxylate linkages, a potentially useful tool for probing the dependence of ET on the metal junction.

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 21 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:731109 CAPLUS

DOCUMENT NUMBER: 135:265705

TITLE: Scaffold-organized cluster formation and nanoelectronic devices made using such clusters

INVENTOR(S): Hutchison, James E.; Wybourne, Martin N.; Reed, Scott M.

PATENT ASSIGNEE(S): State of Oregon, Acting by and Through the State Board of Higher Education On Behalf of the University of Oregon, USA

SOURCE: PCT Int. Appl., 60 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 4

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001073150	A1	20011004	WO 2001-US9644	20010326
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			

PRIORITY APPLN. INFO.: US 2000-191814P P 20000324  
US 2000-226720P P 20000821  
US 2000-231193P P 20000907

AB A method for forming arrays of metal, alloy, semiconductor or magnetic clusters is described. The method comprises placing a scaffold on a substrate, the scaffold comprising, for example, polynucleotides and/or polypeptides, and coupling the clusters to the scaffold. Methods of producing arrays in predetd. patterns and electronic devices that incorporate such patterned arrays are also described.

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 22 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:474105 CAPLUS

DOCUMENT NUMBER: 135:232979

TITLE: The Dynamics of Electron Self-Exchange between Nanoparticles

AUTHOR(S): Hicks, Jocelyn F.; Zamborini, Francis P.; Osisek, Andrea J.; Murray, Royce W.

CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA

SOURCE: Journal of the American Chemical Society (2001), 123(29), 7048-7053

CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The rate of electron self-exchange reactions between discretely charged metal-like cores of nanoparticles was measured in multilayer films of nanoparticles by an electrochem. method. The nanoparticles are Au monolayer-protected clusters with mixed monolayers of hexanethiolate and mercaptoundecanoic acid ligands, linked to each other and to the Au electrode surface with carboxylate-metal ion-carboxylate bridges. Cyclic voltammetry of the nanoparticle films exhibits well-defined peaks for the sequential, single-electron, double-layer charging of the 1.6-nm-diameter Au cores. The electron self-exchange is measured as a diffusion-like electron-hopping process, much as in previous studies of redox polymer films on electrodes. The average electron diffusion coefficient

is

DE =  $10(\pm 5) + 10^{-8}$  cm<sup>2</sup>/s, with no discernible dependence on the state of charge of the nanoparticles or on whether the reaction increases or decreases the core charge. This diffusion constant corresponds to an average

1st-order rate constant kHOP of  $2(\pm 1) + 10^6$  s<sup>-1</sup> and an average self-exchange rate constant, kEX, of  $2(\pm 1) + 10^8$  M<sup>-1</sup> s<sup>-1</sup>, using a cubic lattice hopping model. This is a very large rate constant,

considering the nominally lengthy linking bridge between the Au cores.  
REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 23 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on  
STN

ACCESSION NUMBER: 2001:758103 SCISEARCH  
THE GENUINE ARTICLE: 473LC  
TITLE: Core-shell nanostructured nanoparticle films as chemically  
sensitive interfaces  
AUTHOR: Han L; Daniel D R; Maye M M; Zhong C J (Reprint)  
CORPORATE SOURCE: SUNY Binghamton, Dept Chem, Binghamton, NY 13902 USA  
(Reprint)  
COUNTRY OF AUTHOR: USA  
SOURCE: ANALYTICAL CHEMISTRY, (15 SEP 2001) Vol. 73, No. 18, pp.  
4441-4449.  
ISSN: 0003-2700.  
PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036  
USA.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 52  
ENTRY DATE: Entered STN: 5 Oct 2001  
Last Updated on STN: 5 Oct 2001

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB This paper reports the results of an investigation of vapor molecule  
sorption at different types of nanostructured nanoparticle films.  
Core-shell nanoparticles of two different core sizes, Au2-nm and Au5-nm,  
and molecular linkers of two different binding properties,  
1,9-nonanedithiol and 11-mercaptopundecanoic acid, are utilized  
as building blocks for constructing chemically sensitive interfaces. The  
work couples measurements of two different transducers, interdigitated  
microelectrodes and quartz crystal microbalance, to determine the  
correlation of the electronic resistance change and the mass loading with  
vapor sorption. The responses to vapor sorption at these nanostructured  
interfaces are demonstrated to be dependent on the core size of  
nanoparticles and the chemical nature of linking molecules. The  
difference of molecular interactions of vapor molecules at the  
nanostructured interface is shown to have a significant impact on the  
response profile and sensitivity. For the tested vapor molecules, while  
there are small differences for the sorption of nonpolar and hydrophobic  
vapor molecules, there are striking differences for the sorption of polar  
and hydrophilic vapor molecules at these nanostructured interfacial  
materials. The implication of the findings to the delineation of design  
parameters for constructing core-shell nanoparticle assemblies as  
chemically sensitive interfacial materials is also discussed.

L2 ANSWER 24 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on  
STN

ACCESSION NUMBER: 2001:182921 SCISEARCH  
THE GENUINE ARTICLE: 403FE  
TITLE: Chain length dependence and sensing capabilities of the  
localized surface plasmon resonance of silver  
nanoparticles chemically modified with alkanethiol  
self-assembled monolayers  
AUTHOR: Malinsky M D; Kelly K L; Schatz G C; Van Duyne R P  
(Reprint)  
CORPORATE SOURCE: Northwestern Univ, Dept Chem, Evanston, IL 60208 USA  
(Reprint)  
COUNTRY OF AUTHOR: USA  
SOURCE: JOURNAL OF THE AMERICAN CHEMICAL SOCIETY, (21 FEB 2001)  
Vol. 123, No. 7, pp. 1471-1482.

ISSN: 0002-7863.  
PUBLISHER: AMER CHEMICAL SOC, 1155 16TH ST, NW, WASHINGTON, DC 20036  
USA.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 95  
ENTRY DATE: Entered STN: 9 Mar 2001  
Last Updated on STN: 9 Mar 2001

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB In this paper, we explore the optical properties of Ag nanoparticles chemically modified with alkanethiol self-assembled monolayers (SAMs) by measuring the localized surface plasmon resonance (LSPR) spectrum using UV-vis extinction spectroscopy. For all the experiments presented here, the Ag nanoparticles were fabricated using the technique of nanosphere lithography (NSL) and had in-plane widths of 100 nm and out-of-plane heights of 50 nm. We first demonstrate that unmodified nanoparticles are extremely susceptible to slight changes in 3-dimensional structure when exposed to various solvents. These structural effects can have dramatic effects on the extinction maximum,  $\lambda$  (max), of the LSPR shifting it to the blue by over 100 nm. The significant discovery reported here is that  $\lambda$  (max) for NSL fabricated Ag nanoparticles is extremely sensitive to the SAM properties. We will demonstrate the following new features: (1)  $\lambda$  (max) of the LSPR linearly shifts to the red 3 nm for every carbon atom in the alkane chain; (2) spectral shifts as large as 40 nm are caused by only 60 000 alkanethiol molecules per nanoparticle, which corresponds to only 100  $\mu$ mol of adsorbate; and (3) the nanoparticles' sensitivity to bulk external environment is only attenuated by 20% when the nanoparticles are modified with the longest chain alkanethiol (1-hexadecanethiol, similar to 2 nm). Experimental extinction spectra were modeled by using Mie theory for Ag nanospheres with dielectric shells intended to mimic the self-assembled monolayer (SAM) in thickness and refractive index. We find that the Mie theory qualitatively predicts the experimentally observed trend that  $\lambda$  (max) linearly shifts to the red with respect to shell thickness, or alkanethiol chain length; however, the theory underestimates the sensitivity by approximately a factor of 4. Excellent correlation between theory and experiment was observed when Mie theory was used to predict the degree of attenuation in LSPR sensitivity to bulk external environment when the nanoparticle is encapsulated in a dielectric shell similar to an alkanethiol SAM. Finally, we demonstrate that Ag nanoparticles modified with functionalized SAMs can be used in sensing applications. Here, we show that the LSPR shifts to the red 5 nm with the adsorption of the polypeptide poly-L-lysine (PL) to Ag nanoparticles modified with deprotonated carboxylate groups from 11-mercaptoundecanoic acid (11-MUA). Furthermore, we will show that this system behaves reversibly and exhibits no detectable nonspecific binding.

L2 ANSWER 25 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

ACCESSION NUMBER: 2001:283526 SCISEARCH  
THE GENUINE ARTICLE: 415NR  
TITLE: Quartz-crystal microbalance and spectrophotometric assessments of inter-core and inter-shell reactivities in nanoparticle thin film formation and growth  
AUTHOR: Han L; Maye M M; Leibowitz F L; Ly N K; Zhong C J  
(Reprint)  
CORPORATE SOURCE: SUNY Binghamton, Dept Chem, Binghamton, NY 13902 USA  
(Reprint)  
COUNTRY OF AUTHOR: USA  
SOURCE: JOURNAL OF MATERIALS CHEMISTRY, (2001) Vol. 11, No. 4, pp. 1258-1264.  
ISSN: 0959-9428.

PUBLISHER: ROYAL SOC CHEMISTRY, THOMAS GRAHAM HOUSE, SCIENCE PARK,  
MILTON RD,, CAMBRIDGE CB4 0WF, CAMBS, ENGLAND.  
DOCUMENT TYPE: Article; Journal  
LANGUAGE: English  
REFERENCE COUNT: 38  
ENTRY DATE: Entered STN: 13 Apr 2001  
Last Updated on STN: 13 Apr 2001

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Spontaneous core-shell and shell-shell reactivities of thiolate-capped nanoparticles are exploited for assembling nanoparticle network thin films via an exchange-crosslinking-precipitation route. Gold nanoparticles of two different core sizes (2 and 5 nm) capped with decanethiolates and alkylthiols of two different functionalities, 1,9-nonanedithiol (NDT) and 11-mercaptopundecanoic acids (MUA), were studied as the assembly components. The film formation and growth involve inter-core covalent Au-thiolate bonding at both ends of NDT, or inter-shell non-covalent hydrogen-bonding at carboxylic acid terminals of MUA shells. The present work focuses on a kinetic assessment of the controlling factors based on UV-Visible spectrophotometric and quartz-crystal microbalance measurements. These measurements probe the evolution of the surface plasmon resonance band of nanoparticles and monitor the mass loading of the assembled films, respectively. Both qualitative and quantitative insights have been obtained for understanding the dependences of exchange, nucleation and crystallization processes on core size and shell structure. The implication of the results for designing nanostructured assemblies using core-shell nanoparticles as building blocks is discussed in terms of binding site, core size and shell structure.

L2 ANSWER 26 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2001:75604 CAPLUS

DOCUMENT NUMBER: 134:271718

TITLE: Redox and Double-Layer Charging of Phenothiazine Functionalized Monolayer-Protected Clusters

AUTHOR(S): Miles, Deon T.; Murray, Royce W.

CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA

SOURCE: Analytical Chemistry (2001), 73(5), 921-929

CODEN: ANCHAM; ISSN: 0003-2700

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Monolayer-protected Au clusters (MPCs) have been prepared with mixed monolayers of alkanethiolates and alkanethiolates terminally  $\omega$ -functionalized with phenothiazine. The mixed monolayer MPCs can contain as many as 10 phenothiazines/MPC; these electron donors are electroactive in rapid, successive one-electron reactions. Surface adsorption of the functionalized MPCs is evident in cyclic voltammetry. Double-potential-step chronocoulometry with incremented potential steps was applied to unfunctionalized hexanethiolate-coated MPCs and to those functionalized with phenothiazine to analyze the coupling between the diffusion-controlled double-layer charging of the MPC cores and the oxidation of the phenothiazine centers. Apparent changes in ordering of the MPC alkanethiolate chains were observed with IR spectroscopy in solns. of MPCs where alc., carboxylic acid, or phenothiazine moieties had been incorporated into the monolayer.

REFERENCE COUNT: 53 THERE ARE 53 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 27 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN DUPLICATE 4

ACCESSION NUMBER: 2001:542556 SCISEARCH



THE GENUINE ARTICLE: 449BV  
 TITLE: Labelling and binding of poly-(L-lysine) to functionalised gold surfaces. Combined FT-IRRAS and XPS characterisation  
 AUTHOR: Yam C M (Reprint); Zheng L; Salmain M; Pradier C M; Marcus P; Jaouen G  
 CORPORATE SOURCE: Ecole Natl Super Chim Paris, Lab Chim Organomet, CNRS, UMR 7576, F-75231 Paris 05, France; Ecole Natl Super Chim Paris, Lab Physicochim Surfaces, CNRS, ESA 7045, F-75231 Paris, France  
 COUNTRY OF AUTHOR: France  
 SOURCE: COLLOIDS AND SURFACES B-BIOINTERFACES, (AUG 2001) Vol. 21, No. 4, pp. 317-327.  
 ISSN: 0927-7765.  
 PUBLISHER: ELSEVIER SCIENCE BV, PO BOX 211, 1000 AE AMSTERDAM, NETHERLANDS.  
 DOCUMENT TYPE: Article; Journal  
 LANGUAGE: English  
 REFERENCE COUNT: 29  
 ENTRY DATE: Entered STN: 20 Jul 2001  
 Last Updated on STN: 20 Jul 2001

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB We compare herein the interfacial reactivity of self-assembled monolayers (SAMs) of 11-mercaptoundecanoic acid (MUA), 1-undecanethiol (UDT) and 11-mercaptoundecanol (MUD) on gold surfaces towards aqueous solutions of poly-(L-lysine) (PL). Liquid-phase labelling of PL with the alkyne dicobalt hexacarbonyl cluster 1 combined with analysis of the substrates by Fourier transform infrared reflection-absorption spectroscopy (FT-IRRAS) and X-ray photoelectron spectroscopy (XPS) revealed that irreversible binding of PL occurred in all cases. However, the mechanism of binding involved differed markedly from one monolayer to the other. The main mode of interaction of PL to MUA SAM was of electrostatic nature between the terminal carboxylate of MUA and the ammonium groups of PL. For a similar number of bound thiolate molecules, the UDT adsorbed layer was found less continuous than the MUA one, allowing a higher fraction of PL to directly bind to the gold surface. As for MUD, very little thiolate molecules were adsorbed, leaving bare gold surface areas for non specific adsorption of PL. (C) 2001 Elsevier Science B.V. All rights reserved.

L2 ANSWER 28 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:889755 CAPLUS  
 DOCUMENT NUMBER: 134:137084  
 TITLE: Monolayer-Protected Clusters: Molecular Precursors to Metal Films  
 AUTHOR(S): Wuelfing, W. Peter; Zamborini, Francis P.; Templeton, Allen C.; Wen, Xingu; Yoon, Heidi; Murray, Royce W.  
 CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 25799-3290, USA  
 SOURCE: Chemistry of Materials (2001), 13(1), 87-95  
 CODEN: CMATEX; ISSN: 0897-4756  
 PUBLISHER: American Chemical Society  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Monolayer-protected clusters (MPCs) are used to prepare solid, continuous metal films containing a single white metal or an alloy thereof. MPCs consist of nanoscopic metal cores coated with monolayers of thiolate ligands. In one method, multilayer films of carboxylate-functionalized alkanethiolate MPCs are assembled using Cu<sup>2+</sup> coordinative bridges. The MPC film can be thermally decomposed at moderate temperature (<350°) to produce films of the core metal; the thiolate ligands escape as volatile disulfides. In another method, solns. of MPCs with alkanethiolate monolayers are cast or

painted onto substrates, followed again by thermolysis to produce films of core metals. Films prepared from MPCs having metal alloy cores tend to exhibit metal segregation. A 3rd method uses electrochem. generation of iodide at a Pt electrode to destabilize the MPC monolayer, an action that effectively coats the electrode with Au. The metal films are analyzed by stylus profilometry, atomic force microscopy, energy-dispersive x-ray anal., XPS, SEM, and electrochem.

REFERENCE COUNT: 62 THERE ARE 62 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 29 OF 37 SCISEARCH COPYRIGHT (c) 2006 The Thomson Corporation on STN

ACCESSION NUMBER: 2002:55243 SCISEARCH

THE GENUINE ARTICLE: 509AQ

TITLE: Electroactivity Of Cu<sup>2+</sup> at a thin film assembly of gold nanoparticles linked by 11-mercaptoundecanoic acid

AUTHOR: Israel L B; Kariuki N N; Han L; Maye M M; Luo J; Zhong C J (Reprint)

CORPORATE SOURCE: SUNY Binghamton, Dept Chem, Binghamton, NY 13902 USA (Reprint)

COUNTRY OF AUTHOR: USA

SOURCE: JOURNAL OF ELECTROANALYTICAL CHEMISTRY, (28 DEC 2001) Vol. 517, No. 1-2, pp. 69-76. ISSN: 0022-0728.

PUBLISHER: ELSEVIER SCIENCE SA, PO BOX 564, 1001 LAUSANNE, SWITZERLAND.

DOCUMENT TYPE: Article; Journal

LANGUAGE: English

REFERENCE COUNT: 43

ENTRY DATE: Entered STN: 25 Jan 2002

Last Updated on STN: 25 Jan 2002

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Core-shell nanoparticles are emerging advanced materials for developing novel electroanalytical platforms, This paper describes the results of an investigation of the electroactivity of Cu<sup>2+</sup> ions on electrodes coated with thin films assembled from thiolate-encapsulated gold nanoparticles of 2 nm core size (Au<sub>2</sub>-nm) and a carboxylic functionalized alkyl thiol linker, i.e. 11-mercaptoundecanoic acid (MUA). The high surface-to-volume ratio and the 3-D ligand network properties are potentially useful as sensitive and selective nanomaterials for the monitoring and removal of environmental heavy metals. The nanostructured MUA-Au<sub>2</sub>-nm film is sensitive to Cu<sup>2+</sup> below 1 ppm. The selectivity of the electroactivity is also probed using mixed-metal systems such as Cu<sup>2+</sup> and Fe<sup>3+</sup> and Cu<sup>2+</sup> and Zn<sup>2+</sup>. Issues related to the electrochemical activity of these metal ions are also discussed. (C) 2001 Elsevier Science B.V. All rights reserved.

L2 ANSWER 30 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:786147 CAPLUS

DOCUMENT NUMBER: 134:76878

TITLE: Mercaptoammonium-Monolayer-Protected, Water-Soluble Gold, Silver, and Palladium Clusters

AUTHOR(S): Cliffel, David E.; Zamborini, Francis P.; Gross, Stephen M.; Murray, Royce W.

CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA

SOURCE: Langmuir (2000), 16(25), 9699-9702

CODEN: LANGD5; ISSN: 0743-7463

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB This paper describes Au, Ag, and Pd nanoparticles coated with monolayers of trimethyl(mercaptoundecyl)ammonium ligands. The monolayer-protected clusters (MPCs) are synthesized in aqueous medium and are H<sub>2</sub>O soluble. In dry films, their highly charged surfaces inhibit the interdigitation of monolayer chains known in dry films of alkanethiolate-coated nanoparticles. UV-visible spectra exhibit surface plasmon bands for Au and Ag MPCs at the expected wavelengths but none for Pd clusters. Thermogravimetric and TEM results suggest that Au and Ag nanoparticles readily aggregate through ionic association of the terminal NH<sub>4</sub><sup>+</sup> groups but without metallic core fusion between particles. Two-component multilayers of MPCs can be affixed to surfaces by alternating exposure to anionic, mixed-monolayer hexanethiolate-mercaptoundecanoic acid MPCs and cationic Au NH<sub>4</sub><sup>+</sup>-MPCs.

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 31 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:463293 CAPLUS

DOCUMENT NUMBER: 133:183607

TITLE: Controlled and Reversible Formation of Nanoparticle Aggregates and Films Using Cu<sup>2+</sup>-Carboxylate Chemistry  
AUTHOR(S): Templeton, Allen C.; Zamborini, Francis P.; Wuelfing, W. Peter; Murray, Royce W.

CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA

SOURCE: Langmuir (2000), 16(16), 6682-6688  
CODEN: LANGD5; ISSN: 0743-7463

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The controlled and reversible formation of transiently soluble alkanethiolate- and tiopronin-monolayer-protected cluster (MPC) aggregates is demonstrated by using Cu<sup>2+</sup>-carboxylate chemical to form cluster-Cu<sup>2+</sup>-cluster linkages. The aggregation process and its reversibility were monitored using UV-vis and FTIR spectroscopy. The amount of Cu<sup>2+</sup> required to induce aggregation of dissolved tiopronin-MPCs is a strong function of pH, increasing at lower pH. Cu<sup>2+</sup>-carboxylate chemical can also be utilized to prepare surface-attached films of tiopronin-MPCs in a manner analogous to alkanethiolate-MPCs, monitoring the film formation using FTIR external reflectance spectroscopy. Expts. exploring the diffusional and capacitive properties of tiopronin-MPCs are also reported.

REFERENCE COUNT: 50 THERE ARE 50 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 32 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:402328 CAPLUS

DOCUMENT NUMBER: 133:110476

TITLE: Monolayer-Protected Clusters with Fluorescent Dansyl Ligands

AUTHOR(S): Aguila, Ailette; Murray, Royce W.

CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA

SOURCE: Langmuir (2000), 16(14), 5949-5954  
CODEN: LANGD5; ISSN: 0743-7463

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Monolayer-protected Au cluster (MPC) mols. with mixed monolayers of alkanethiolate and  $\omega$ -carboxylalkanethiolate ligands were functionalized with the fluorescent label dansyl cadaverine. The emission intensity per MPC-attached dansyl group varies with (a) the number of dansyl

sites per MPC (i.e., loading, 4 to 24), (b) with the linker chain length between Au core and dansyl site, and (c) with chain lengths of alkanethiolates in the surrounding MPC monolayer coating. Emission intensity per MPC-attached dansyl group increases with loading and with the length of core-dansyl linker chains when the surrounding alkanethiolate monolayers have chain lengths equal to or greater than the linker. These results are interpreted in terms of distance-dependent energy transfer from the excited dansyl label to the metal-like MPC core and various steric constraints on thermal fluctuations of linker chains that influence the distance of approach of the label to the core. Correction for self-absorption by the highly colored MPC solution was necessary. Emission intensities of MPC-attached dansyl labels are lower than those from equivalent concns. of dansyl units and MPCs as unattached cosolutes.

REFERENCE COUNT: 42 THERE ARE 42 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 33 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 2000:254295 CAPLUS

DOCUMENT NUMBER: 132:339774

TITLE: Quantized Double Layer Charging of Nanoparticle Films Assembled Using Carboxylate/(Cu<sup>2+</sup> or Zn<sup>2+</sup>)/Carboxylate Bridges

AUTHOR(S): Zamborini, Francis P.; Hicks, Jocelyn F.; Murray, Royce W.

CORPORATE SOURCE: Kenan Laboratories of Chemistry, University of North Carolina, Chapel Hill, NC, 27599-3290, USA

SOURCE: Journal of the American Chemical Society (2000), 122(18), 4514-4515

CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB This paper describes monolayer or multilayer nanoparticle films based on ligand/metal ion/ligand linkers that have not been previously described. The authors prepare films of 1.6 nm diameter monolayer-protected Au clusters (MPCs), with mixed hexanethiolate/mercaptohexanoic acid or hexanethiolate/mercaptoundecanoic acid monolayers, that exhibit well-defined, concerted, single-electron charging of their double layers. The MPCs are attached in a two-step dip and rinse cycle to COOH-functionalized Au and glass substrates by carboxylate/(Zn<sup>2+</sup> or Cu<sup>2+</sup>)/carboxylate bridges. The cycle can be repeated to attach further MPCs as desired and, depending on the concentration and soaking times of the metal ion and MPCs, multilayers can become surface-attached even in a single dip cycle.

REFERENCE COUNT: 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 34 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 5

ACCESSION NUMBER: 2000:30750 CAPLUS

DOCUMENT NUMBER: 132:191288

TITLE: A self assembled shell of 11-mercaptoundecanoic aminophenylboronic acids on gold nanoclusters

AUTHOR(S): Valina-Saba, M.; Bauer, G.; Stich, N.; Pittner, F.; Schalkhammer, T.

CORPORATE SOURCE: Institute of Biochemistry and Molecular Cell Biology, Vienna, 1030, Austria

SOURCE: Materials Science & Engineering, C: Biomimetic and Supramolecular Systems (1999), C8-C9, 205-209

CODEN: MSCEEE; ISSN: 0928-4931

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Sensors employing gold clusters coated with biomimetic compds. offer considerable advantages like long-term stability and simple sensor handling in comparison to sensors based on bioaffinity interactions. We took advantage of the unique properties of boronate mols. in binding hexose as well as their ability to form self assembled monolayers (SAMs) on 14 nm Gold nanoclusters. 11-Mercaptoundecanoic aminophenylboronic acid was synthesized in a one pot reaction step. The hydroxyl group of 11-mercaptoundecanoic acid was coupled with aminophenylboronic acid via activation by carbonyldiimidazole (CDI). Gold nanoclusters were covered with a monolayer of these boronate mols. by a self assembling process. At a pH of 9.5 thiols were found to bind irreversibly to the surface of gold nano-clusters, producing a particle exposing sugar binding sites to the solution; these clusters were stable against centrifugation, high salt and low pH. Such clusters were bound to the sensor surface at defined distance from a mirror layer. Thereby cluster-absorption was strongly enhanced. This phenomenon enables us to transduce affinity interactions highly amplifying changes in surface coverage of clusters. The optical properties of the sensors were found to be dependent on the size and number of the metal-clusters as well as their distance to the metal layer sputtered on the support surface.

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 35 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:800015 CAPLUS

DOCUMENT NUMBER: 130:46271

TITLE: Scaffold-organized metal, alloy, semiconductor, and/or magnetic clusters and electronic devices made using such clusters

INVENTOR(S): Wybourn, Martin N.; Hutchison, James E.

PATENT ASSIGNEE(S): The State of Oregon Acting by and Through the State Board of Higher Education, USA

SOURCE: PCT Int. Appl., 38 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 4

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9853841	A1	19981203	WO 1998-US10795	19980527
W:	AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW			
RW:	GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG			
AU 9876979	A1	19981230	AU 1998-76979	19980527
PRIORITY APPLN. INFO.:			US 1997-47804P	P 19970527
			WO 1998-US10795	W 19980527

AB A method for forming arrays of metal, alloy, semiconductor, or magnetic clusters comprises placing a scaffold comprising polynucleotides and/or polypeptides on a substrate. Polypeptides capable of forming  $\alpha$ -helices are currently preferred for forming scaffolds. Arrays are then formed by contacting the scaffold with plural, monodispersed ligand-stabilized clusters. Each cluster, prior to contacting the scaffold, includes plural exchangeable ligands bonded to it. If the

clusters are metal clusters, then the metal is preferably Ag, Au, Pt, and/or Pd. A currently preferred metal is Au, and a currently preferred metal cluster is Au<sub>55</sub> having a radius of .apprx.0.7-1 nm.

Compns. also are described, 1 use for which is in the formation of cluster arrays. One embodiment of the composition comprises plural monodispersed, ligand-stabilized clusters coupled to a polypeptide.

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 36 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN

ACCESSION NUMBER: 1998:269974 CAPLUS

DOCUMENT NUMBER: 129:40690

TITLE: Gateway Reactions to Diverse, Polyfunctional Monolayer-Protected Gold Clusters

AUTHOR(S): Templeton, Allen C.; Hostetler, Michael J.; Warmoth, Emily K.; Chen, Shaowei; Hartshorn, Chris M.; Krishnamurthy, Vijay M.; Forbes, Malcolm D. E.; Murray, Royce W.

CORPORATE SOURCE: Kenan and Venable Laboratories of Chemistry, University of North Carolina, Chapel Hill, AR, 27599-3290, USA

SOURCE: Journal of the American Chemical Society (1998), 120(19), 4845-4849  
CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Amide and ester coupling reactions of  $\omega$ -functionalized monolayer-protected Au cluster mols. (MPCs) are an exceptionally efficient avenue to a diverse variety of polyfunctionalized MPCs starting from a small subset of  $\omega$ -functionalized materials. Coupling reactions were employed to produce 13 MPCs with multiple copies of a diverse variety of structural groups. Detailed features of three of the 13 polyfunctionalized products are highlighted: (a) stepwise coupling and deprotection reactions result in an MPC surrounded by ca. eight pendant tripeptides, (b) a preliminary steady-state ESR (SSEPR) experiment is described for MPCs bearing multiple spin labels (.apprx.13/cluster), and (c) a polyelectron electrochem. reaction is described for an MPC bearing multiple (.apprx.7/cluster) coupled phenothiazine derivs. The coupling reactions substantially expand the available diversity of MPCs as polyfunctionalized chemical reagents platformed on a nanometer-sized central core.

REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 37 OF 37 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 6

ACCESSION NUMBER: 1999:35900 CAPLUS

DOCUMENT NUMBER: 130:179039

TITLE: Direct electron transfer of adrenodoxin-a [2Fe-2S] protein- and its mutants at modified gold electrode

AUTHOR(S): Jin, Wen; Wollenberger, Ulla; Bernhardt, Rita; Stocklein, Walter F. M.; Scheller, Frieder W.

CORPORATE SOURCE: Institute of Biochemistry and Molecular Physiology, University of Potsdam, Luckenwalde, 14943, Germany  
SOURCE: Bioelectrochemistry and Bioenergetics (1998), 47(1), 75-79

CODEN: BEBEBP; ISSN: 0302-4598

PUBLISHER: Elsevier Science S.A.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Adrenodoxin can adsorb on polyallylamine modified surfaces at low ionic

strength, because of local acidic surface. After a gold electrode was modified with a multilayer of mercaptoundecanoic acid and polyallylamine the direct heterogeneous electron transfer between adrenodoxin and the electrode has been achieved. The apparent electron transfer rate constant keto was estimated to be .apprx.0.14 s<sup>-1</sup> and the midpoint redox potential to be -0.46±10 mV. Peak current is proportional to scan rate up to 150 mV s<sup>-1</sup> indicating that wt-Adx was adsorbed on the electrode surface. Two mutants were investigated which show at the same modified electrode a redox potential shift of about 30 mV in the neg. direction. An increase in the heterogeneous electron transfer rate and efficiency of cytochrome c reduction were observed with both mutants as compared to wild type adrenodoxin.

REFERENCE COUNT: 41 THERE ARE 41 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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NEWS EXPRESS JUNE 30 CURRENT WINDOWS VERSION IS V8.01b, CURRENT  
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=> (gold (s) cluster) and polylysine and (substrate or silicon or (silcon (s)  
nitride) or (ultraflat (s) glass))

L1 3 (GOLD (S) CLUSTER) AND POLYLYSINE AND (SUBSTRATE OR SILICON OR  
(SILCON (S) NITRIDE) OR (ULTRAFLAT (S) GLASS))

=> dup rem l1  
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L2 2 DUP REM L1 (1 DUPLICATE REMOVED)

=> d ibib abs l2 1-2

L2 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2006 ACS on STN DUPLICATE 1  
ACCESSION NUMBER: 2001:731109 CAPLUS  
DOCUMENT NUMBER: 135:265705  
TITLE: Scaffold-organized cluster formation and  
nanoelectronic devices made using such clusters  
INVENTOR(S): Hutchison, James E.; Wybourne, Martin N.; Reed, Scott  
M.  
PATENT ASSIGNEE(S): State of Oregon, Acting by and Through the State Board  
of Higher Education On Behalf of the University of  
Oregon, USA  
SOURCE: PCT Int. Appl., 60 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 4  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001073150	A1	20011004	WO 2001-US9644	20010326
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
PRIORITY APPLN. INFO.:			US 2000-191814P	P 20000324
			US 2000-226720P	P 20000821
			US 2000-231193P	P 20000907

AB A method for forming arrays of metal, alloy, semiconductor or magnetic  
clusters is described. The method comprises placing a scaffold on a

substrate, the scaffold comprising, for example, polynucleotides and/or polypeptides, and coupling the clusters to the scaffold. Methods of producing arrays in predetd. patterns and electronic devices that incorporate such patterned arrays are also described.

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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ACCESSION NUMBER: 2002-170704 [22] WPIDS

CROSS REFERENCE: 1999-312406 [26]; 2002-442882 [47]; 2003-479435 [45]

DOC. NO. CPI: C2002-052630

TITLE: Determining target nucleic acid sequence useful for diagnosing genetic disease or chromosomal abnormality, comprises determining identity of polypeptide encoded by nucleic acid by using mass spectrometry technique.

DERWENT CLASS: A89 B04 D16

INVENTOR(S): HIGGINS, G S; KOESTER, H; LITTLE, D; LOUGH, D

PATENT ASSIGNEE(S): (SEQU-N) SEQUENOM INC

COUNTRY COUNT: 1

PATENT INFORMATION:

PATENT NO	KIND	DATE	WEEK	LA	PG
US 6322970	B1	20011127	(200222)*	50	

APPLICATION DETAILS:

PATENT NO	KIND	APPLICATION	DATE
US 6322970	B1 CIP of	US 1997-922201	19970902
		US 1998-146054	19980902

PRIORITY APPLN. INFO: US 1998-146054 19980902; US 1997-922201 19970902

AN 2002-170704 [22] WPIDS

CR 1999-312406 [26]; 2002-442882 [47]; 2003-479435 [45]

AB US 6322970 B UPAB: 20030716

NOVELTY - New process for determining, (M1), target nucleic acid, (TN), sequence comprises determining identity of polypeptide (P) encoded by TN.

DETAILED DESCRIPTION - Determining, (M1), target nucleic acid (TN) sequence by determining identity of polypeptide (P) encoded by TN involves:

(1) preparing encoded (P) from TN by in vitro translation, or by in vitro transcription followed by translation, of TN;

(2) determining molecular mass of encoded (P) by mass spectrometry; and

(3) determining identity of (P) by comparing molecular mass of (P) with molecular mass of corresponding known (P).

An INDEPENDENT CLAIM is also included for a process for obtaining information on sequences of several nucleic acid molecules by determining the identity of several target polypeptides encoded by the nucleic acid molecules involves (M2-M3):

(a) carrying out steps:

(i) obtaining several nucleic acid molecules encoding several target polypeptide;

(ii) preparing a several differentially mass modified target polypeptides from the several nucleic acid molecules;

(iii) determining the molecular mass of each differentially mass modified target polypeptide in the set by mass spectrometry; and

(iv) determining the identity of each target polypeptide in the set by comparing the molecular mass of each differentially mass modified target polypeptide in the set with molecular mass of a corresponding known

polypeptide, thereby obtaining information on several nucleotide sequences encoding the target polypeptides, where each encoded polypeptide is immobilized on the solid support through a cleavable linker; and

(b) carrying out steps:

(i) ; and

(ii) as described for (M2);

(iii) contacting each of the encoded polypeptide with at least one agent that cleaves at least one peptide bond in each encoded polypeptide to produce peptide fragments of each encoded polypeptide;

(iv) determining the molecular mass of at least one of the peptide fragments of each encoded polypeptide in the plurality by mass spectrometry; and

(v) determining the identity of the each encoded polypeptide in the plurality by comparing the molecular mass of peptide fragments of each encoded polypeptide with the molecular mass of peptide fragments of a corresponding known polypeptide.

USE - Obtaining information on a sequence of target nucleic acid molecule by determining identity of a polypeptide encoded by a nucleic acid molecule. The target nucleic acid encoding a polypeptide may be an allelic variant of a polymorphic region of a gene (e.g., BRCA11, BRCA2, APC, dystrophin gene, beta -globin, Factor IX, factor VIIc, ornithine-d-amino-transferase, hypoxanthine guanine phosphoribosyl transferase, cystic fibrosis transmembrane conductance regulator (CFTR), p53, or a proto-oncogene) of a subject, or an allelic variant of a polymorphic region that is located in a chromosomal region that is not in a gene (e.g., a mitochondrial gene). The polymorphic region (e.g., major histocompatibility complex) may be associated with graft rejection, and the novel method in this case is useful for determining compatibility between a donor and recipient of a graft. The allelic variant which is due to a point mutation may be associated with a disease or condition, thereby indicating that a subject has or is at risk of developing a disease or condition. The disease or condition can be associated with an abnormal number of nucleotide repeats (trinucleotide repeats) in the allelic variant, e.g., Huntington's disease, prostate cancer, Fragile X syndrome type A, myotonic dystrophy type I, Kennedy disease, Machado-Joseph disease, denatorubral and pallidolusian atrophy, spino bulbar muscular atrophy or aging. The target nucleic acid optionally may comprise nucleotide repeats and the novel method is used for genotyping the subject, forensic analysis and paternity testing. The genotyping is performed by quantifying the number of nucleotide repeats which may be dinucleotide, trinucleotide, tetranucleotide, or pentanucleotide repeats. The method is useful for obtaining sequence information of a target nucleic acid obtained from an infectious organism such as virus, bacterium, fungus or a protist. (M1) is useful for identifying a target nucleic acid molecule by determining the identity of a polypeptide encoded by the nucleic acid molecule. The method involves preparing the encoded polypeptide by in vitro transcription followed by translation, of a target nucleic acid molecule encoding the polypeptide; contacting the encoded polypeptide with at least one agent that cleaves at least one peptide bond in the encoded polypeptide to produce peptide fragments of the encoded polypeptide; determining the molecular mass of at least one of the peptide fragments of the encoded polypeptide by mass spectrometry; and comparing the molecular mass of the peptide fragments of the encoded polypeptide with the molecular mass of peptide fragments of a corresponding known polypeptide, thereby determining the identity of the encoded polypeptide and the target nucleic acid molecule. The encoded polypeptide is immobilized to a solid support prior to contacting the encoded polypeptide with the agent (preferably, an endopeptidase), through a cleavable linker. Preferably, the encoded polypeptide is immobilized to a solid support through a chemically cleavable linker at one terminus of the polypeptide and through a photocleavable linker at the other terminus of the polypeptide. The encoded polypeptide or its fragments is conditioned prior to step (iii) or the fragments of the encoded polypeptide are conditioned

prior to step (iv). The conditioning is by anion exchange, cation exchange, treatment with an alkylating agent, treatment with trialkylsilylchloride or incorporation of modified amino acids (all claimed). (M1) can also be used for diagnosing a genetic disease or chromosomal abnormality; a predisposition to or an early indication of a gene influenced disease or condition, e.g., obesity, atherosclerosis, diabetes, or cancer; or an infection by a pathogenic organism, e.g., virus, bacterium, parasite or fungus; or to provide information relating to identity, heredity or compatibility using mini-satellite or micro-satellite sequences for human leukocyte antigen (HLA) phenotyping. The methods are also useful for identifying mutations, and thus for screening genetic disorders.

ADVANTAGE - The method is fast, reliable, for indirectly obtaining nucleic acid sequence information. Mass spectrometric detection of polypeptides yields analytical signals of far higher sensitivity and resolution than signals routinely obtained with DNA due to the inherent instability of DNA to volatilization and its affinity for non-volatile cationic impurities.

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<input type="checkbox"/>	L8	6322970.pn.	1
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<input type="checkbox"/>	L6	(gold with cluster) same polylysine same (substrate or silicon or (silcon with nitride) or (ultraflat with glass))	0
<input type="checkbox"/>	L5	5521289.pn. and substrate	1
<input type="checkbox"/>	L4	(polylysine or scaffold) same (10 or nm or angstrom) and L1	1
<input type="checkbox"/>	L3	polylysine and L1	1
<input type="checkbox"/>	L2	monodispers\$ and L1	1
<input type="checkbox"/>	L1	10/816603	1

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<input type="checkbox"/>	L8	polylysine same (attach\$ or coupl\$ or bind or bond\$) same substrate SAME (silicon or nitride or ultraflat or gold)	15
<input type="checkbox"/>	L7	POLYLYSINE	6136
<input type="checkbox"/>	L6	(polylysine same (attach\$ or coupl\$ or bind or bond\$)) same substrate same (silicon or (silicon with nitride) or (ultraflat with glass) or gold)	14
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<input type="checkbox"/>	L5	10/816603 and polylysine	1
<input type="checkbox"/>	L4	(polylysine with (coupl\$ or bind or bond\$)) same (silicon or (silicon with nitride) or (ultraflat with glass) or gold)	13
		<i>DB=USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L3	L2	2
		<i>DB=PGPB,USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L2	(polylysine with (coupl\$ or bind or bond\$)) same substrate same (silicon or (silicon with nitride) or (ultraflat with glass) or gold)	5
		<i>DB=USPT; PLUR=YES; OP=OR</i>	
<input type="checkbox"/>	L1	(polylysine with coupl\$) same substrate same (silicon or (silicon with nitride) or (ultraflat with glass) or gold)	0

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